# NASA-USDA

## "Collaboration Support Tools for Agriculture"

Remarks for the NASA/USDA Air Quality Meeting
Denver, CO
March 4-5, 2003

Thank you. Chief, Bruce Knight would have liked to be here but was unable to clear his schedule. Not only is Air Quality an important environmental issue for the Natural Resources Conservation Service but the Chief also chairs the Agriculture Air Quality Task force. I am Deputy Chief for Soil Survey and Resource Assessment and as part of my functions I lead the agency's effort on global climate change and greenhouse gases one of the issues being discussed at this conference. My counterpart, Larry Clark, Deputy Chief for Science and technology has responsibility for air quality.

Today, I would like to first give you a bit of background on our agency and how the agency mission fits with air quality issues, then talk a bit about importance of this issue for agriculture, and finish with comments on USDA-NRCS requirements for air quality.

The mission of the NRCS is to provide leadership in a partnership effort to help people conserve, maintain, and improve our natural resources and environment.

We have been doing this for almost 70 years. In 1933, the U.S. Congress created the Soil Erosion Service, predecessor to the Soil Conservation Service. Then in 1994-95 our name was changed to the Natural Resources Conservation Service, thus expanding our mission beyond soil and water to air, plants and animals.

We have staff stationed in local offices to reach practically all of the private landowners in the nation's nearly 3,000 counties. In 1937, states began enacting laws that created local soil conservation districts and local groups began organizing these districts. Presently almost every county in the U.S. has a soil conservation district. In conservation district offices, NRCS employees work directly with the locally elected

conservation district board to develop a plan of operation and priorities for the entire district. The board sets conservation priorities to meet local needs.

Under this system, NRCS and District employees work with farmers and ranchers to address conservation and environmental issues on their farmers and ranches. This is accomplished through a conservation planning process where eventually the entire farm or ranch is planned to a resource management system. Our staff use a progressive planning process where a farmer or rancher can chose to gradually reach a goal of a complete system that protects all resources. We call this a resource management system.

As part of the process producers may apply for financial assistance to apply necessary practices to reach planning goals. We currently have many programs in the 2002 Farm Bill to address these financial needs. The EQIP (Environmental Quality Improvement Program) is the main cost share program that will be used to address air quality issues. This year there is $695 million dollars available in EQIP program.

The planning process is dynamic and flexible because

- Every client is unique
- Every farm or ranch is unique
- Every planning situation is unique
- And all of our programs are voluntary

In the planning process, there are many supporting programs that provide background data. The Soil Survey program, an inventory of the nation's soil resources, is 91% complete for all lands and 97% complete for privately owned lands in the U.S. The soil survey information is the basis for all planning activities. We also have the National Resources Inventory that monitors trends in the quality of the nation's natural resources. Data from this inventory are used to target high risk areas, as well as to monitor the effectiveness of Farm Bill programs.

We have many manuals and handbooks to support the planning process. One of the more important guides is the Field Office Technical Guide, known as the FOTG. It is now electronic and anyone can access it by going to the agency website. Included in the FOTG are practices from the National Handbook of Conservation Practices - currently with 159 national conservation practices. Of these, we are revising 53 standards to address air quality needs. We are writing 2 new ones - atmospheric resource management and biomass production and harvest.

Each state selects practices that apply to their resource needs. States usually modify

the national standards to fit local needs. These practice standards are based on proven science and research, much of which is performed by the USDA Agricultural Research Service and research funded by CSREES..

**Why is air quality important to agriculture?**

1. The crucial point for agriculture is being able to carry out agricultural activities in an economic and viable manner while meeting environmental goals. The agricultural sector is one of the few sectors in the U.S. that has a positive trade balance with other countries.
2. We are concerned with health issues of our farmers and ranchers. On a daily basis, they deal directly with dust, chemical fumes, pollen, and odors. Our farmers and ranchers are well aware of health issues and it is a personal concern to them.
3. Do we have best management practices to help our farmers enable them to be compliant with the air quality regulations? Can we measure the impact of these practices and other measures that farmers and ranchers are doing on air quality of a region?
4. Agriculture needs abatement strategies that are affordable, doable, and accomplish goals of improving air quality.

Agriculture is concerned that regulations are preceding the science of air quality. Are measurement techniques adequate, do they measure what is leaving a farmer or rancher's property? I think that the answer to these questions is no, the science is not adequate. However, we have a large number of arm chair scientists who drive past a farming or ranching operation, and visually observe dust coming from an operation and automatically assume that the farmer is out of compliance. It may well be the exhaust from the automobile that is causing the problem.

Without sound science, we can not justify making that kind of connection or placing a burden on landowners to take actions that may or may not solve the problem. In addition, if agricultural activities are the reasons for non-compliance with air standards, we must know what is causing the problem and how to remedy to problem.

**USDA requirements in air quality**

Chief Knight often says that air quality is at the same place today that water quality was twenty years ago. At least in water quality the watershed is fairly well defined – on a topographic map. However, it takes our imagination to envision what the airshed is and how every entity in the airshed impacts the quality of air in it. The fickleness of the winds complicates the concept even more. We have our work cut out

in many fronts, including developing the science on which to define the issues, defining policies that address air quality problems, devising conservation measures that solve the problems, and ensuring that we can measure our progress.

Some of our research needs include:

1. Develop accurate PM10 and PM2.5 emission factors from agricultural activities
2. Determine the contribution of agricultural activities such as burning, processing, non-road engine emissions, field activities, wind erosion, and concentrated animal feeding operations to ambient levels of PM10 and PM2.5
3. Improved PM10 and PM2.5 dispersion modeling methodology including speciation, deposition, and transport.
4. Determine/monitor ozone levels in rural areas and determine the contribution of anthropogenic and non-anthropogenic (biogenic) sources of NOx and reactive volatile organic compounds (VOCs). Determine the contribution of ozone precursors (NOx, NH3 and reactive VOCs) from agricultural operations.
5. Develop and validate models to predict ozone effects on crop productivity including statistical, economic, and plant growth process models. Develop dispersion modeling procedures that can be used to accurately estimate concentrations of precursors from agricultural fugitive and point sources impacting downwind ambient ozone concentrations.
6. Improved dispersion modeling methodology including odor release, transport and receptors.
7. NH3 dispersion/transport to determine the scope and extent of plumes from an AFO or areas of high concentration of AFOs.
8. Determine Emissions reductions associated with various conservation practices
9. Improved methane capture technology to include economic methods for smaller herds.
10. Development of NO2 models for agriculture that address both animal manures and commercial fertilizers.

As you can see our needs are great!!! But the clincher is once we have a handle on all of this, we will need some sort of decision support system to put it all together. Unlike regulations that tend to address each pollutant separately, the farming or ranching operation is a complete system. We need to know the interactions of conservation systems with respect to all resources, soil, plants, water, air, and animals.

Thank your for your attention.